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INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

529543

Applicant's or agent's file reference KOLON-PORE	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR2003/002170	International filing date (day/month/year) 17 OCTOBER 2003 (17.10.2003)	Priority date (day/month/year) 18 OCTOBER 2002 (18.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 D01F 1/00		
Applicant KOLON INDUSTRIES, INC et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the report
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 17 MAY 2004 (17.05.2004)	Date of completion of this report 03 FEBRUARY 2005 (03.02.2005)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer OH, SANG KYUN  Telephone No. 82-42-481-8165

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/002170

I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2003/002170

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-15	YES
	Claims	NO
Inventive step (IS)	Claims 1-15	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-15	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents identified in the International Search Report(ISR):

D1 : US 5762840 A (09 June 1998)

D2 : US 6051174 A (18 April 2000)

The claimed invention relates to a microcellular fiber, in which microcells are formed with a density of more than 107cells/cm³ with a supercritical fluid introduced into fiber forming polymers and have a rate of volume expansion of 1.2 to 5.0, a ratio of microcell length to microcell diameter of more than 2 and a monofilament diameter of more than 5μm. The microcellular fiber is made by a method for making microcellular fibers, wherein a supercritical fluid is introduced into an extruder upon melting and mixing fiber forming polymers in the extruder, to thus prepare a single-phase solution of molten polymer and gas, then single-phase solution of molten polymer and gas is extruded through spinneret of a spinning pack by subjecting the single-phase solution to a rapid pressure drop, to thus make microcellular extrusion materials, then the microcellular extrusion materials are rapidly cooled, and then they are wound at a winding speed of 10 to 6,000m/min so that a spinning draft can be 2 to 300.

D1 discloses a distinctive technique for making porous fiber including a stretching of a substantially continuous fiber while the fiber is in an operative association with an effective quantity of surface-active material.

D2 discloses an extrusion system for providing a foamed material in which a material such as a polymer material is supplied to an extruder for movement through a rotating screw member. The material is placed in a molten state and a foaming agent, such as a supercritical fluid, is introduced into the extruder at a selected pressure so that a two-phase mixture of the molten material and the foaming agent is formed.

The feature of a microcellular fiber in the present invention in which microcells are formed with a density of more than 107cells/cm³ with a supercritical fluid introduced into fiber forming polymers, is not disclosed in D1 and D2. Therefore, the subject matter of claims 1 to 15 is novel pursuant to PCT Article 33(2).

The subject matter of claims 1 to 15 is considered to involve an inventive step pursuant to PCT Article 33(3), since it refers to an improved product, such as the microcellular fibers providing high and uniform cell densities and good in the rate of volume expansion and the ratio of cell length to cell diameter, thus having very excellent lightweight feeling and touch, which is not known or even suggested in the prior art, particularly in D1 and D2.

Claims 1 to 15 also meet the criteria set out in PCT Article 33(4), because all the claims are considered to be industrially applicable.